

LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1-29. (Cancelled).

30. (Previously presented) An apparatus for the heating of melts, comprising:
a melting vessel with cooled walls for receiving a melting material, and
at least two electrodes for conductively heating a melt, wherein the at least two electrodes each have a melt contact surface that replaces part of the cooled walls of the melting vessel.

Claims 31-71 (Cancelled).

72. (New) The apparatus as claimed in claim 30, wherein the at least two electrodes are inserted into cutouts in the cooled walls of the melting vessel.

73. (New) The apparatus as claimed in claim 30, wherein the at least two electrodes have a surface area that replaces more than 1% of a surface area of the melting vessel.

74. (New) The apparatus as claimed in claim 30, wherein the at least two electrodes have a surface area that replaces more than 10% of a surface area of the melting vessel.

75. (New) The apparatus as claimed in claim 30, wherein the at least two electrodes have a surface area that replaces more than 15% of a surface area of the melting vessel.

76. (New) The apparatus as claimed in claim 30, wherein the at least two electrodes comprise cooling-fluid passages.

77. (New) The apparatus as claimed in claim 30, further comprising at least one device for cooling the at least two electrodes.

78. (New) The apparatus as claimed in claim 77, wherein the at least one device for cooling is sufficient to cool the melting material in contact with the at least two electrodes.

79. (New) The apparatus as claimed in claim 77, wherein the at least one device for cooling comprises a fluid-conveying device.

80. (New) The apparatus as claimed in claim 79, wherein the fluid-conveying device comprises a low-pressure blower that builds up a pressure difference of less than 1,000 mbar.

81. (New) The apparatus as claimed in claim 77, wherein the at least one device for cooling comprises at least two cooling circuits each comprising a different cooling media.

82. (New) The apparatus as claimed in claim 81, further comprising a device for controlling a cooling power of the at least two electrodes.

83. (New) The apparatus as claimed in claim 77, wherein the melting vessel comprises a region of the cooled walls not formed by the at least two electrodes, the apparatus further comprising a device for cooling the region.

84. (New) The apparatus as claimed in claim 30, wherein the melting vessel comprises skull walls and/or ceramic walls.

85. (New) The apparatus as claimed in claim 30, wherein the melting vessel comprises skull walls and/or ceramic walls.

86. (New) The apparatus as claimed in claim 84, wherein the melting vessel comprises skull walls having cooled metallic tubes, the cooled metallic tubes being lined with a material of poor electrical conductivity on a side of the cooled metallic tubes facing the melt.

87. (New) The apparatus as claimed in claim 84, wherein the material of poor electrical conductivity comprises SiO_2 slip.

88. (New) The apparatus as claimed in claim 30, wherein the at least two electrodes are electrically insulated with respect to the cooled walls of the melting vessel.

89. (New) The apparatus as claimed in claim 30, further comprising a device for generating alternating current with a frequency in a range from 50 Hz to 50 kHz.

90. (New) The apparatus as claimed in claim 89, wherein the range is from 2 kHz to 10 kHz.

91. (New) The apparatus as claimed in claim 30, wherein the melt contact surface of the at least two electrodes comprises a material having electrically conductive ceramic selected from the group consisting of SnO_2 ceramic, refractory metals, tungsten, molybdenum, tantalum, osmium, hafnium, platinum, iridium, rhodium, and any combinations, or alloys thereof.

92. (New) The apparatus as claimed in claim 30, wherein the melt-contact surface comprises high-strength platinum.

93. (New) The apparatus as claimed in claim 30, wherein the at least two electrodes are arranged in a lower part of the melting vessel opposite one another.

94. (New) The apparatus as claimed in claim 93, wherein the at least two electrodes are arranged below a melt bath surface.

95. (New) The apparatus as claimed in claim 30, wherein at least one of the electrodes forms a region of the cooled wall that has a shape selected from the group consisting of a planar shape, an annular shape, and a segment of a ring.

96. (New) The apparatus as claimed in claim 30, further comprising a bridge immersed in the melt from above through a melt bath surface.

97. (New) The apparatus as claimed in claim 30, further comprising a heating device selected from the group consisting of at least one fossil burner, at least one plasma torch, at least one resistance heating element, at least one infrared radiator, and any combinations thereof.

98. (New) The apparatus as claimed in claim 30, further comprising at least one blowing nozzle arranged at a base of the melting vessel.

99. (New) The apparatus as claimed in claim 30, wherein at least one of the electrodes comprises a heating apparatus.

100. (New) The apparatus as claimed in claim 99, wherein the heating apparatus comprises a device selected from the group consisting of an ohmic heating device, a current source connected to the melt-contact surface, a current source connected to a conductive material beneath the melt-contact surface, and an apparatus for heating a cooling fluid.

101. (New) The apparatus as claimed in claim 30 further comprising a vessel for receiving melting material that comprises a surface which reflects infrared radiation.

102. (New) The apparatus as claimed in claim 101, wherein the surface is a polished surface.

103. (New) The apparatus as claimed in claim 101, wherein the surface comprises a coating that reflects infrared radiation, the coating comprising a material selected from the group consisting of gold, platinum, nickel, chromium, and rhodium.

104. (New) The apparatus as claimed in claim 101, wherein the surface comprises the melt-contact surface of at least two electrodes.